

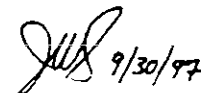
ATTACHMENT J.4.91
SYSTEM SAFETY REQUIREMENTS
RM-2116

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SYSTEM SAFETY REQUIREMENTS

RM-2116

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FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

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Record of Revisions

Revision	Date	Description of Issuance/Revision
0	02-21-95	New document required to establish safety analysis program standards, requirements, and responsibilities for the FEMP per Request No. S94-111, initiated by E. R. Schmidt. This document replaces FMPC-2116, dated 01-01-89, Rev. 0, and provides direction for Functional Area No. 9, Nuclear and System Safety (NS) and its related implementing procedures.
1	04/10/96	Adding FEMP's USQD/SE System requirements and general update. Initiated by J.W. Smith.
2	08/01/96	Modifications to USQD/SE System requirements, addition of a definition of nuclear experience, and minor editorial changes. Initiated by VE Werner.
3	10/13/97	General revision, including title and format changes to incorporate ICPs, organizational changes, and update of program issues. Initiated by VE Werner/James W. Smith.

SYSTEM SAFETY REQUIREMENTS MANUAL

1.0 INTRODUCTION

This document establishes the basic principles, responsibilities, and requirements of the Fernald Environmental Management Project (FEMP) System Safety portion of the Nuclear and System Safety Functional Area. These requirements are provided to help ensure the health and safety of the public, the workers, and the environment through the generation, use, and maintenance of FEMP safety basis documentation.

Implementing procedures will provide detailed responsibilities and processes (steps) necessary for conducting system safety analyses, preparing technical safety requirements, the determination of unreviewed safety questions, the review of safety basis documentation, and the analysis, design, development, implementation and evaluation of training and qualification programs.

1.1 Drivers

- RM-0016, *Fluor Daniel Fernald Management Plan*
- PO-NS-01, *Presidential Policy for Nuclear and System Safety*,
- Standards/Requirements Identification Document (S/RID), Functional Area No. 9 *Nuclear and System Safety (NS)*

1.2 References

- 10 CFR 830.120, QUALITY ASSURANCE REQUIREMENTS
- DOE Order 5480.20A, PERSONNEL SELECTION, QUALIFICATION, TRAINING, AND STAFFING
- DOE Order 5480.21, UNREVIEWED SAFETY QUESTION
- DOE Order 5480.22, TECHNICAL SAFETY REQUIREMENTS
- DOE Order 5480.23, NUCLEAR SAFETY ANALYSIS REPORTS
- DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*

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- DOE-EM-STD-5502-94, *Hazard Baseline Documentation*
- EM Memorandum, *Delegation of Review and Approval Authority for Safety Documentation and for Start-up/Restart for Environmental Management Activities*, dated August 08, 1994.
- RM-0012, *Quality Assurance Program*
- RM-0021, *Safety Performance Requirements*
- RM-0027, *Nuclear Criticality Safety Requirements*
- ED-12-1003, *Engineering Design Glossary*

1.3 **Attachments**

In addition to the information contained in the body of this document, additional information is provided in the following four attachments:

- Attachment A: Definitions
- Attachment B: Abbreviations and Acronyms
- Attachment C: System Safety Process Flow Diagrams
- Attachment D: System Safety Document Hierarchy

2.0 **SCOPE**

The requirements and responsibilities contained herein shall apply to all FDF personnel and subcontractors responsible for the following:

- Facilities, projects, or activities that require safety analyses, technical safety requirements, determination of unreviewed safety questions, or review of safety basis documentation; and
- Implementation of the drivers described in Section 1.1 of this document.

3.0 **DEFINITIONS**

NOTE: The definitions contained in this document are to be used in lieu of the definitions listed in the site "Glossary of Definitions and Terms", GDT-300.

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Refer to Attachment A for a complete list of definitions. This attachment is provided as a centralized list of program definitions that can be removed from RM-2116 for ease of use. Refer to Attachment B for a list of abbreviations and acronyms.

4.0 REQUIREMENTS

Requirements for the following System Safety major programs are described in this section in the order given:

- Safety Analyses Program, including hazard analysis and categorization, safety assessments, human factors evaluations, process requirements, accident analysis and review;
- Safety Basis Requirements (SBRs), e.g., Technical Safety Requirements (TSRs) for nuclear facilities and Operational Safety Requirements (OSRs) for other facilities;
- Unreviewed Safety Question Determination and Safety Evaluation (USQD/SE) System, including the training and qualification of Qualified Safety Evaluators (QSEs);
- Safety Basis Document Review (SBDR); and
- NS Program/System Training and Qualification Requirements.

4.1 General Requirements for System Safety

- 4.1.1 A System Safety organization, shall be established by FDF and maintained independent of groups performing remediation activities. System Safety is currently part of the Safety Analysis (SA) Team.
- 4.1.2 All programs in the Nuclear and System Safety Functional Area shall be governed by and shall conform to the format and content requirements of applicable laws, standards, DOE Orders and guides using instructions provided in the applicable FEMP site/other procedures and requirements documents.
- 4.1.3 The System Safety programs' documentation, including implementing procedures, shall meet and be based upon the requirements contained in this manual.
- 4.1.4 The System Safety organization shall implement Quality Assurance (QA) requirements for the FEMP Safety Analysis Program in accordance with RM-0012, *Quality Assurance Program Description*, or any revisions thereof.

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- 4.1.5 All System Safety safety analyses, shall be reviewed, with such reviews being documented, on an annual basis and, as needed, revised throughout the life of the facility, project, or activity to ensure the maintenance of a valid safety basis.. An unreviewed safety question determination, a safety basis document review, or other similar, documented review shall reset the annual review clock, i.e., the documented date of review shall constitute the end of one annual cycle and the start of the next cycle.
- 4.1.6 Personnel qualification shall be established for technical personnel involved in the development and review of safety basis documentation.
- 4.1.7 The FEMP shall maintain and control all safety basis documentation and appropriate supporting documents, as specified in procedures, guides, and other applicable safety basis documentation, to ensure that users of these documents have access to current editions.
- 4.1.8 The System Safety programs requirements described in this document shall be integrated with and, where practical and appropriate, combined with the programmatic requirements of the Nuclear Criticality Safety Program as defined in RM-0027, *Nuclear Criticality Safety Requirements*.

4.2 Safety Analyses Program Requirements

The Safety Analyses Program is required to comply with all applicable requirements of DOE Order 5480.23 as specified in the site S/RID. These requirements are provided to help ensure the health and safety of the public, the workers, and the environment through the conduct and use of documented safety analyses, including hazard analysis and categorization, safety assessments, human factors evaluations, accident analysis and safety basis document review.

The FEMP Safety Analyses Program provides the programmatic guidance, direction, and technical resources for implementing FDF PO-NS-01, *Presidential Policy Nuclear and System Safety*. The Safety Analysis Program is integrated with other safety and health programs through RM-0021, *Safety Performance Requirements Manual* (see the document hierarchy in Attachment D). The FEMP Safety Analyses Program is developed, maintained and administered by the Safety Analysis (SA) Team.

The Safety Analyses Program is served by the following key processes:

- Safety Assessment/Hazard Screening
- Hazard Categorization/Classification

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- **Auditable Safety Record**
- **Safety Analysis Report/Basis of Interim Operations.**

4.2.1 The FEMP Safety Analyses Program shall recognize and incorporate into all program requirements and procedures the following principles:

- a. The responsibility for the conduct of appropriate safety analyses rests with Line Management in regard to preparing, reviewing, and implementing the requirements of safety analyses designed to ensure that:**
 - (1) Potential hazards are systematically identified;**
 - (2) Potential consequences are analyzed;**
 - (3) Reasonable measures are taken to eliminate, control, or mitigate hazards; and**
 - (4) Documented management authorizations of FEMP operations are obtained and maintained based upon an objective assessment of safety analyses.**
- b. The organization(s) responsible for planning and engineering FEMP facilities, projects, and activities and the SA Team shall work in conjunction to determine the appropriate hazard category and resulting requirements as early in the process as possible. Assumptions and criteria shall be jointly developed to ensure full understanding of the potential hazards.**
- c. Hazard analysis shall be conducted in an integrated manner with other safety organizations. This Integrated Hazard Analysis (IHA) shall address not only nuclear and issues, but also other safety issues such as radiological, chemical, fire, occupational safety and respiratory protection.**
- d. The hazards identified in the IHA shall be addressed by Line/Project Management in the applicable project-specific documentation so as to appropriately address, mitigate, and control these hazards prior to the start of work.**
- e. The graded approach as described in DOE Order 5480.23, NUCLEAR SAFETY ANALYSIS REPORTS, shall be used to determine the appropriate levels of analysis and documentation for each nuclear facility commensurate with:**

- (1) The magnitude of the hazards being addressed;
- (2) The complexity of the facility, systems, or activities being relied on to maintain an acceptable level of risk;
- (3) The stage or stages of the facility, project, or activity life cycle for which DOE approval is sought; and
- (4) Mission, timing, and importance to the overall FEMP goals.

4.2.2 As required by current DOE Orders and anticipated Federal Regulations, the FEMP will develop and execute implementation plans, such as PL-3049, for upgrading the Safety Analyses Program and the existing FEMP Safety Basis documentation in a manner that supports safely restoring the Fernald Site to an end state which serves the communities' needs.

4.2.3 Independent technical reviews shall be required for all safety analyses requiring DOE approval.

4.2.4 All safety analyses shall be completed, reviewed, and approved prior to starting work or physically modifying a FEMP facility, project, or activity.

4.2.5 *A Request for Safety Analysis Support, Form FS-F-2706-2*, shall be submitted to the Safety Analysis Team Coach at the beginning of the conceptual design, prior to completion of project-specific plans to ensure integration of the safety analysis program.

4.2.6 The FEMP shall perform and document hazard analyses of its facilities, projects, and activities as early as practicable in the design and development stages to classify processes, operations, and activities in accordance with the following requirements:

- a. The hazard categorizations/classifications for Nuclear, Non-Nuclear, Radiological, and Other Industrial Facilities, as described in DOE-EM-STD-5502-94, shall be used.
- b. The consequences of radioactive and/or hazardous material releases shall be evaluated and classified without taking credit for mitigation;
- c. The hazard analysis shall be based on the maximum potentially releasable or allowable inventory of radioactive and nonradioactive hazardous materials and the potential consequences associated with their being stored, utilized, or otherwise associated with the facility, project, or activity.

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- d. The hazard analysis shall identify energy sources or processes that might contribute to an uncontrolled release.
 - e. The greater the hazard or potential adverse consequences of an item, the more detailed the safety analysis shall be for that item.
 - f. Safety analysis documents shall contain the hazard analysis and shall be developed, controlled, and issued to DOE, if required, as specified in site procedures, guides, and other applicable safety analysis documentation.
 - g. When an activity or facility is determined in the course of the hazard screening to be Standard Industrial Hazards (SIHs) and standard construction activities, it is not usually subject to further rigorous hazard analysis review by the SA Team.
 - h. Integrated hazard analysis teams that represent the appropriate technical elements associated with the targeted facility, project, or activity will be employed whenever practical to avoid duplication of effort and to improve the consistency, quality, and coordination of hazard analyses.
 - i. Integrated hazard analysis (IHA) teams identify both potentially safety significant (PSS) and other, not-as-significant (for the purposes of system safety analysis), hazards. PSS hazards shall be addressed in the applicable, project-specific safety analysis. Other, non-PSS, hazards identified by the IHA shall be addressed in either a safety assessment or other applicable, project-specific safety documentation such as an ALARA Report, HAZOP, Human Factors Evaluation, Job Safety Analysis, or Project-Specific Health and Safety Plan.
- 4.2.7 At a minimum, **ALL** FEMP facilities, projects, and activities shall be screened for hazard categorization/classification.
- 4.2.8 The responsible line manager and the Coach of SA Team are required to approve the safety assessment as reported in the results summary of the *Request for Safety Analysis Support* before further analysis is performed.
- 4.2.9 The *Request for Safety Analysis Support* form, Form FS-F-2706-2, is also used to request the performance of a Human Factors Evaluation (HFE), but an HFE does not determine the hazard classification and page 2 of the form is not applicable to the HFE.
- 4.2.10 The responsible project/activity/facility manager, the SA Team Coach, and the Technical Specialist who performed the evaluation are required to concur/approve the Human Factors Evaluation (HFE).

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- 4.2.11 Whenever practical, an HFE shall be integrated with other related safety organization assessments/evaluations/reports to provide the project under discussion with a broad spectrum approach to the human element requirements and recommendations for the project.
- 4.2.12 Each safety analysis shall be documented and maintained in a retrievable and auditable condition to allow independent reviewers access to the same information and data used to perform the original analysis.
- 4.2.13 Process Requirements (PRs) may be generated and implemented for nuclear, non-nuclear, radiological, and other industrial facilities/activities, as appropriate. PRs are approved by FDF.
- 4.2.14 PRs may be associated with engineered or administrative controls related to the higher level SBRs, e.g., TSRs (nuclear facility/activity) or OSRs (other than nuclear facility/activity). PRs may also be developed and implemented to help ensure that TSRs, OSRs, and other SBRs are not exceeded or otherwise violated. PRs are not SBRs.
- 4.3 Safety Basis Requirements (SBRs)**
- 4.3.1 A Safety Basis Requirement (SBR) is derived from a safety basis document (SBD).
- 4.3.2 In nuclear facilities with a Safety Analysis Report (SAR), Basis of Interim Operation (BIO), or Hazard Analysis Report (HAR), the SBRs consist of the established Technical Safety Requirements (TSRs), if any, and those limits especially established and designated SBR in the applicable safety basis documentation. Additionally, see process requirements, at 4.2.13 and 4.2.14.
- 4.3.3 The following requirements apply for FEMP TSRs:
- a. FDF shall develop, implement, and maintain, as necessary, Technical Safety Requirement (TSR) documents for FEMP nuclear facilities, per DOE Order 5480.22
 - b. Independent technical reviews of all TSRs are required before they are submitted for DOE approval.
 - c. TSRs shall be subject to the USQD/SE process.
 - d. TSRs shall be approved at authorization levels commensurate with their respective safety bases.

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- 4.3.4 In FEMP facilities which are not nuclear, the SBRs are those limits especially established and designated SBR in the applicable safety basis documents, such as auditable safety Record (ASR), and safety assessments. Additionally, see process requirements at 4.2.13 and 4.2.14.

Examples of SBRs are an inventory threshold limit or a dose limit established in a safety basis document; and, a limitation on material types, characteristics, and unique properties, such as, pyrophoricity, corrosiveness, toxicity, reactivity, flammability, etc. as assumed in the analysis. Nuclear criticality safety requirements related to the direct prevention of a criticality; i.e., maintaining compliance with the double contingency principle is an SBR. Requirements for other-than-TSR safety basis requirements are described in the definition of Safety Basis Requirement (SBR) (see Attachment A).

- 4.3.5 A Safety Basis Requirement such as an Operational Safety Requirement (OSR) may be developed for FEMP facilities/projects/activities when safety analysis determines that TSRs are not required.
- 4.3.6 Once established as SBR, the requirement shall be entered into the FEMP Commitment Tracking System (CTS). After initial implementation is satisfied, the SBR is declared complete for the CTS and is transferred to the SA Team surveillance list.
- 4.3.7 SBR surveillances are usually scheduled on a quarterly basis, but may be scheduled for other interval lengths, up to annually, if in the professional opinion of those responsible for the determination such intervals provide effective oversight for the implementation of the affected SBR.

4.4 Unreviewed Safety Question Determination and Safety Evaluation (USQD/SE) System Requirements

The FEMP shall implement an Unreviewed Safety Question (USQ) Program consistent with DOE Order 5480.21, UNREVIEWED SAFETY QUESTION, that assesses changes involving nuclear facilities, projects, or activities relative to the authorization basis. It may also apply to other facilities/projects/activities that have DOE-approved safety basis documentation.

The Safety Analysis Team has the responsibility for the development and maintenance of the FEMP USQ Program, identified as the Unreviewed Safety Question Determination and Safety Evaluation (USQD/SE) System. This section describes the requirements for the FEMP USQD/SE System. Also included are the selection and training criteria and requirements for the Technically Responsible (TR) individuals as well as those for the Qualified Safety Evaluators (QSEs).

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- 4.4.1 The USQD/SE System shall be applied to all FEMP nuclear facilities that have current, existing DOE-approved safety basis document(s) and to all changes impacting the applicable facilities/activities. Existing safety basis documentation shall be reviewed for potential implications against it from the proposed changes. Such reviews shall be documented, integrated with the FEMP Configuration Management Control Program, and maintained in an auditable format.
- 4.4.2 Per DOE Order 5480.21, the primary responsibility, authority, and accountability for the direction and management of the USQ process, reside with the line management of the FDF organizations responsible for design and safety analyses.
- 4.4.3 On a schedule corresponding to the periodic updates of the DOE-approved safety documentation, a report shall be submitted to DOE-FEMP summarizing all situations for which a safety evaluation was required by DOE Order 5480.21, and indicating all proposed changes considered in a safety evaluation and implemented six months or more before the submittal date of the report.
- 4.4.4 A known change to a DOE-approved TSR/OSR automatically requires DOE approval, as required by DOE Order 5480.21. The appropriate line organization management, the ISRC and the President of FDF review these proposed changes to determine their support, concurrence, and/or approval of the proposed change before it is submitted to DOE.
- 4.4.5 When FDF identifies information that indicates a potential inadequacy of previous safety analyses or a possible reduction in the margin of safety as defined in the TSRs, FDF shall:
 - a. Notify the DOE of the situation upon discovery of the information;
 - b. Take action to place the facility in a safe condition until the safety evaluation is completed; i.e., take steps assuring that operation is conducted in a mode or manner within the authorization basis, despite the potential analytic discrepancy;
 - c. Complete a safety evaluation and submit it to the DOE prior to removing any operational restrictions implemented to compensate for the potential inadequacy or possible reduction of safety; and
 - d. Submit the completed safety evaluation prior to removing any operational restrictions initiated by the discovery of the information in (1); if the USQD/SE determines a USQ to be present, the safety evaluation shall require not only DOE review, but DOE approval, prior to removing any operational restrictions.

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- 4.4.6 USQD/SE System documentation shall provide a sufficient level of detail for a Technically Responsible (TR) individual or a Qualified Safety Evaluator (QSE) to reach an informed determination, and for the reviewing and approving management personnel, including the ISRC, to be able to comprehend how the conclusion was reached.
- 4.4.7 All approved USQD/SE System documents and their supporting documentation which is required to be submitted as part of a USQ determination package shall be maintained, retained and controlled as auditable records by the SA Team.
- 4.4.8 Independent technical reviews are required for all USQD/SEs which demonstrate that a USQ exists.
- 4.4.9 Review and approval signatures for USQD/SE System documents shall be at least as follows:
- a. When an exclusion applies to the issue, the USQ Screen requires the review and concurrence of the assigned QSE;
 - b. When an exclusion does not apply, the USQ Screen requires the concurrence/approval of the assigned QSE and the SA Team Coach;
 - c. When no USQ is determined to exist, the USQD safety evaluation requires, as a minimum, the concurrence/approval of the assigned QSE, a peer reviewer, and the SA Team Coach; and
 - d. When a USQ does exist, in addition to the three previous signatures, the USQD/SE requires the signature of the ISRC Chair (or designated representative) and the President of FDF before the USQD/SE with the result of a USQ is transmitted to DOE for their approval.
- 4.4.10 USQD/SE System Log numbers are controlled and issued by the SA Team. Each USQ Screen and USQD/SE shall be identified by an administratively controlled number (USQD-YY-XXXX). This number shall consist of the following parts:
- (1) Document Identifier (USQD);
 - (2) A two-digit year of performance indicator (97, 98, 99 etc.); and
 - (3) A unique four-digit number indicating the sequence in which the number was issued in a given year (0001 to 9999).
- 4.4.11 The SA Team shall support and approve the development, content, and implementation of training for the USQD/SE System.

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4.4.12 For the purpose of selection, training and qualification, as described in DOE Order 5480.20A, Qualified Safety Evaluators (QSEs) are hereby designated as being within the category of Technical Support Staff/Personnel.

4.4.13 The QSE will normally be on the staff of the SA Team; and only the Safety Analysis Team Coach can authorize persons not on the staff of the SA Team to take the QSE training or to perform QSE functions. Members of the Independent Safety Review Committee (ISRC) as well as others not on the SA Team who take the QSE qualification training, unless otherwise determined and documented by the SA Team Coach, will be assigned the designation of QSE--REVIEWER when they have successfully completed the QSE qualification training.

4.4.14 If a QSE performs the function(s) of a TR (i.e., preparation of a USQ Screen) for a given issue, the same QSE cannot then perform the QSE function(s) for the same issue (e.g., review and concur with the USQ Screen or conduct the USQD safety evaluation).

4.5 Safety Basis Document (SBD) Review Process Requirements

4.5.1 A review of changes to facilities/projects/activities which have FDF-approved safety basis documentation, similar to that required under the USQD/SE System for facilities/projects/activities which have DOE-approved safety basis documentation, shall be conducted using the Safety Basis Document Review process.

4.5.2 Changes impacting FDF-approved safety basis documentation facilities/projects/activities shall be reviewed for potential implications against the existing safety basis documents (SBDs). Such reviews shall be documented, integrated with the FEMP Configuration Management Control Program, and maintained in an auditable format.

4.5.3 The SA Team has the responsibility for the development and maintenance of the FEMP Safety Basis Document Review (SBDR) process.

4.5.4 Line management of the FDF organizations responsible for facilities, activities, and/or projects that have FDF-only-approved safety basis documents shall have the prime responsibility for the implementation of the SBDR process.

4.6 System Safety Program/System Training and Qualification Requirements

The SA Team provides support and oversight for several training programs and also provides the development and implementation for others, which include the professional qualification programs for SA Team members.

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In the performance of this responsibility, the SA Team staff shall implement the applicable Training and Qualification Functional Area requirements and procedures as well as the effective portions of the applicable DOE Orders and standards.

- 4.6.1 For the USQ for Technically Responsible (TR) individuals training program and the SBDR for Change Initiators (CIs) briefing program, the SA Team has the responsibility to ensure that the content is correct and that the training/briefing is implemented in a manner consistent with the requirements of the program/system it represents.
- 4.6.2 For the training/briefing courses/programs listed under 4.6.1, the requirements are as follows:
 - a. In the performance of this responsibility, the assigned cognizant member(s) of the SA Team and the SA Team Coach shall review and concur/approve all training materials, including the lesson plan(s), study guides, handouts and overheads, to ensure content accuracy and applicability.
 - b. One or more cognizant members of the SA Team staff shall attend and review at least the dry run of each of the training/briefing courses associated with the programs listed under 4.6.1 to ensure that the content and implementation are within the requirements of the program being addressed.
 - c. Technically Responsible (TR) individuals, chosen by their respective managers, shall at least meet the following minimum selection and training criteria:
 - (1) Education and Experience - minimum requirements per DOE Order 5480.20A, or job specific requirements as determined by the respective leadership. The minimum requirements for TRs who qualify under DOE Order 5480.20A as Technical Support Personnel are nearly the same as those listed for the QSE (See Attachment A: Definitions for Nuclear Experience). The minimum for operations personnel is high school diploma; the nuclear facility experience required is determined by the TR candidate's immediate supervision/management.
 - (2) Successful completion of USQ-TR training course - successfully complete the USQ-TR training course specific to their responsibilities; and
 - (3) Retraining requirement - USQ-TR continuing training (for procedure/forms updates and lessons learned) is required by DOE

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Order 5480.21 every two years from the original successfully completed date in order to maintain the training current.

- d. The instructor(s) for the USQ-TR training course shall at least meet the minimum selection and training criteria for the TR, and have successfully completed the applicable TR training prior to instructing the training course.

4.6.3 The SA Team has the responsibility to ensure that the following professional training and qualification programs, are in compliance with the applicable portions of the requirements of DOE Order 5480.20A and the FEMP Training and Qualification Functional Area requirements and procedures, as well as the laws, standards, DOE Orders and FEMP NS Functional Area requirements which apply to the programs being addressed.

- System Safety Analyst (SSA) Qualification; and
- Unreviewed Safety Question (USQ): Safety Evaluator Qualification Training.

4.6.4 For the training courses/programs listed under 4.6.3, the requirements are as follows:

- a. The qualifications of personnel in the safety analysis organization shall be defined, documented as required by DOE Order 5480.20A, and implemented in FDF Training requirements manual(s) and procedures.
- b. An applicable job analysis report and training program document shall be issued for each of the above listed professional training and qualification programs. The content of these documents shall address the requirements of DOE Order 5480.20A and the Order's FEMP implementing requirements and procedures.
- c. QSE candidates shall meet at least the following minimum selection and training criteria:
 - (1) Education and experience - minimum requirements of DOE 5480.20A for Technical Support Staff personnel which are a BS degree and two years of experience with one year of nuclear facility experience (See Attachment A: Definitions for Nuclear Experience). Alternatives to education and experience are described in the Order.

- (2) Documentation of eligibility - a letter, memo, or other form of written document shall be prepared by his/her manager to verify that a QSE candidate meets at least the minimum qualifications.
 - (3) Successful completion of USQD/SE System training courses - successfully complete the USQ-TR training course and the USQ for Safety Evaluator Qualification Training Program specific to their responsibilities.
 - (4) Training requalification - USQ-QSE continuing training is required every two years from the original successfully completed date in order to maintain the qualification. The QSE Requalification training shall encompass the USQ-TR retraining requirement for the QSE.
 - (5) The examination and/or performance demonstration results, along with the documentation of eligibility, shall be retained in the candidate's permanent, official training record.
- d. The instructor for the USQ-QSE qualification training course shall be a fully qualified QSE prior to conducting the USQ-QSE qualification training course work.

5.0 RESPONSIBILITIES

FEMP personnel shall adhere to the assumptions and commitments set forth in the applicable safety analyses generated for FEMP facilities, projects, or activities, which possess potential hazards to workers, the public, and/or the environment.

5.1 Functional Area Managers' Responsibilities

5.1.1 FAM(s) for Configuration Management (CM) and Engineering Design (ED)

- a. Ensure all new or modified facilities and activities receive the appropriate level of safety basis documentation as early in the life cycle as possible.
- b. Submit Requests for Safety Analysis Support to the SA Team Coach.
- c. Administratively support the ISRC and its members in performing reviews of FEMP safety basis documentation, USQD safety evaluations which indicate that a USQ exists, and assure appropriate operational readiness reviews (ORRs) are based on nuclear facility hazard categories.
- d. Ensure the total integration of safety analysis documents, unreviewed safety question determinations, and safety evaluations with the FEMP

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Configuration Management Program and the implementation of configuration control.

- e. Develop specifications and drawings or review such items prepared for subcontractors, vendors, or their servicing agents designed to ensure adherence to the assumptions and commitments set forth in all applicable safety basis documents (SBDs) related to the contract work scope.**
- f. Implement USQD/SE System when applicable.**
- g. Implement SBDR process when applicable.**

5.1.2 FAM(s) for Maintenance (MT), Operations (OP) and Packaging and Transportation (PT)

- a. Assume line management responsibility for producing, reviewing, and submitting safety analysis documentation for review and approval, for activities and operations within area of responsibility.**
- b. Submit Requests for Safety Analysis Support to the SA Team Coach.**
- c. Provide assistance in the preparation of safety analysis documentation, including safety analysis reports for packaging (SARPs), related to facility engineering and maintenance, support operations, projects, and facility management.**
- d. Incorporate the measures identified in safety basis documents (SBDs) into work plans, TSRs, SOPs, Emergency Operating Procedures (EOPs), and other procedures, as required.**
- e. Establish procedures for ensuring the development and use of applicable safety basis requirements (SBRs) and Implementation Plans, and for the implementation of the USQD/SE System and the SBDR process.**
- f. Notify and coordinate with the SA Team Coach, through assigned facility owners/supervisors, all changes to facilities, projects, and activities with safety basis documentation, implementing the USQD/SE System and the SBDR process when applicable.**

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5.1.3 FAM(s) for Nuclear and System Safety (NS), Emergency Preparedness and Management (EM), Fire Protection (FP), Occupational Safety and Health (SH), and Radiological Protection (RP)

- a. Promote awareness of the System Safety requirements, including USQD/SEs, SBDs, Human Factors Evaluations (HFEs), and Nuclear Criticality Safety Programs, their requirements and corresponding responsibilities among the DOE, FDF personnel.
- b. Assist the SA Team Coach with the integration of the NS Functional Area and other appropriate functional areas.
- c. Support the SA Team and provide assistance in the preparation of safety basis documentation related to health and safety programs; e.g., emergency preparedness, fire protection, occupational safety and health, and radiological protection.
- d. Ensure that applicable requirements from SARs, ASRs, TSRs, and SBRs are included in health and safety plans (HASPs), as applicable.
- e. NS Functional Area Manager notifies the President of FDF when information or a situation has been identified that indicates a potential deficiency of previous DOE-approved safety documentation or a possible reduction in the margin of safety as defined in DOE-approved TSRs or OSRs.
- f. NS Functional Area Manager shall ensure that Quality Assurance (QA) requirements are implemented for the FEMP Safety Analyses Programs in accordance with 10 CFR 830.120, QUALITY ASSURANCE REQUIREMENTS and RM-0012, *Quality Assurance Program Description*, or any revisions thereof. These requirements shall include: document review, approval, and control; self-assessment; and personnel qualifications.

5.1.4 FAM for Quality Assurance (QA)

- a. Provides independent program assessment and oversight throughout the FEMP.
- b. Performs, in conjunction with Safety Analysis Team, reviews of facilities, projects, and activities subject to TSRs, SBRs, or administrative controls as documented in safety basis documentation. Informs line management of technical problems or unsafe conditions and supports efforts to correct noted deficiencies.

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5.1.5 FAM for Training and Qualification (TR)

- a. Provides training on program requirements, standards, and policies to line and support organizations.
- b. Maintains training and qualification records of the technical support staff and others who are trained and/or qualified via programs supported or administered by the SA Team.

5.1.6 FAM(s) for Acquisitions and Property Management (PM)

- a. Ensure that all FEMP contracts contain the appropriate provisions, program requirements, standards, specifications, and policies related to the FEMP Safety Analyses programs as specified in DOE Order 5480.23.

NOTE: As a minimum, each FEMP contract shall contain a clause or statement requiring the contractor, vendor, or their servicing agents to adhere to the assumptions and commitments set forth in all applicable safety analysis documentation related to the contract work scope.

5.1.7 FAM for Project Control (PC) ensures the total integration of safety analysis documents, USQD/SEs, and other safety evaluations as they relate to scheduling and cost controls as well as project performance measures and reports.

5.1.8 FAM Environmental Restoration and Waste Management (EW) integrates the System Safety programs requirements with other EC programs, including regulatory policy, environmental protection, permitting, environmental planning and environmental risk assessment.

5.1.9 FAM for Construction (CT)

- a. Ensures all decontamination and decommissioning and construction facilities receive the appropriate level of safety analysis as early in the life cycle as possible.
- b. Develops specifications or reviews specifications prepared for subcontractors, vendors, or their servicing agents designed to ensure adherence to the assumptions and commitments set forth in all applicable safety basis documentation related to the contract work scope.
- c. Implements the USQD/SE System and SBDR process when applicable.

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5.2 **Specific Organizations' Responsibilities**

5.2.1 **Line Management** assumes primary responsibility, authority, and accountability for complying with the FEMP System Safety Programs contained in this document, as well as in Federal Laws, Regulations, DOE Orders, Standards, Guides, and other Nuclear and System Safety Functional Area requirements described in this document, applicable to the FEMP for design, operation, and safety of the facility, project, or activity.

5.2.2 **FDF President**

- a. Establishes FDF policy for Nuclear and System Safety and assumes overall responsibility for complying with DOE Orders and other external requirements as required in the FEMP Standards/Requirements Identification Document (S/RID).
- b. Charters and sponsors the Independent Safety Review Committee (ISRC) and appoints in writing the ISRC Chair, in accordance with the applicable FEMP internal procedure.
- c. Approves all major safety analyses documents, such as: SARs, BIOs, USQD/SEs, and TSRs prior to being submitted to the DOE.
- d. Notifies the DOE Fernald Project Office (DOE-FEMP) when information or a situation has been identified that indicates a potential deficiency of previous DOE-approved safety basis document, including the BIOs, or a possible reduction in the margin of safety as defined in a DOE-approved TSR or OSR.
- e. Reviews and approves/denies all USQD/SEs that demonstrate the existence of a USQ, and all proposed changes to DOE-approved TSRs/OSRs received from the Independent Safety Review Committee (ISRC). Returns denied packages to the SA Team Coach for action.
- f. Submits to DOE-FEMP for their review and approval completed and FDF-approved USQD/SEs that indicate the existence of a USQ, and all approved, proposed changes to DOE-approved TSRs/OSRs.
- g. Receives DOE approval prior to authorizing the implementation of a proposed action or the resumption of operations for situations determined to involve a USQ, or a change to a DOE-approved TSR/OSR.

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5.2.3 Project Division Leadership ensures programmatic compliance, integration, funding, and line/staff management support of safety analyses within their respective areas of responsibility.

5.2.4 Line Management and Technical Support Staff

- a. Ensure the performance of appropriate safety analyses for all facilities and associated projects and activities, prior to the commencement of any physical work, major procurement, or other financial commitments.
- b. Obtain, using the applicable FEMP procedure, a safety basis and subsequent safety authorization, as prescribed in EM memorandum dated August 8, 1994, DOE-EM *Safety Authorization Delegation of Authority*, prior to physical work or financial commitment, unless a specific request for exemption has been submitted and approved.
- c. Implement the USQD/SE System and the SBDR process when applicable.

5.2.5 Project Managers

- a. Assume line management responsibility for producing, reviewing, and submitting safety analysis documentation for review and approval, of projects within their area of responsibility.
- b. Submit Requests for Safety Analysis Support to the SA Team Coach.
- c. Ensure all facilities, projects, and activities within their respective projects (areas of responsibility) receive the appropriate level of safety analysis as early in the life cycle as possible.
- d. Coordinate with FDF Contracting Officer Technical Representatives (COTR) to ensure that safety analysis provisions required by DOE Order 5480.23 are included in FEMP subcontracts, as appropriate.
- e. Address all issues identified in the IHA, not only those pertaining to nuclear and system safety, ensuring the implementation of measures to control or mitigate the identified issues. For example, if an IHA identifies a radiological issue, the project management would be required to ensure that an ALARA plan/report was developed and implemented for the project/activity addressed in the IHA.
- f. Incorporate the measures identified in safety analysis documents into work plans, SOPs, and other procedures, as required.

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- g. Notify and coordinate with the SA Team all changes to facilities, projects, and activities with safety basis documentation.
- h. Implement the USQD/SE System and SBDR process when applicable.

5.2.6 Line Management of organizations that are responsible for safety-related activities and/or can initiate changes to nuclear facilities or related activities (including procedures and training)

- a. Ensure that sufficient individuals within their organizations successfully complete the USQ-TR Training course and are assigned to identify unauthorized changes and perform USQ Screens for all proposed activities, modifications and/or proposed procedure changes or other issues under their responsibility. The TRs will also support the QSE in the completion of any required USQD/SEs.
- b. Ensure that all individuals involved with the design, engineering, maintenance, inspection, operations, and assessment of nuclear facilities and activities at, or affected by, the FEMP within their organizations are familiar with the requirements of the USQD/SE System, and are able to identify potential USQs during the course of carrying out their normal responsibilities.
- c. Ensure the technical review processes within their departments are enhanced to include determination of nuclear and system safety significance, including the necessity for appropriate level of review for safety basis documentation when any changes or modifications of facilities or projects/activities are proposed.
- d. Determine appropriate shutdown or precautionary measures needed when a deficiency or unauthorized change is discovered; and determine appropriate restart or startup measures needed to resume safe operations.
- e. Authorize corrections/modifications resulting from the USQD/SE System determinations and ensure that such corrections/modifications occur as required.
- f. Ensure that the President of FDF and the SA Team Coach are kept informed when actions are taken with regard to a nuclear facility and/or activity.
- g. Request additional or revised safety analysis when an existing condition may adversely impact the safety of a facility and/or activity.

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- h. Ensure lessons learned are applied to the USQD/SE System and the SBDR process in their organizations.
- i. Ensure that Technical Review Board (TRB) is notified of all USQD/SE System cleared/approved changes for all configuration-managed SSCs as documented in USQD/SEs.

5.2.7 Contractors and Subcontractors

- a. Satisfy all contractual provisions within FEMP contracts related to the FEMP Safety Analysis Program, as appropriate.
- b. Support and participate in the preparation of safety basis documents by providing technical information as requested concerning equipment and processes to be used during each work activity and phase, when included as part of their contract.
- c. Serve as subject experts during the preparation of safety basis documentation, when included within the scope of their work scope.
- d. Review and comment upon safety basis documentation prepared for related facilities, projects, and activities, when included within the scope of their scope of work.
- e. Adhere to the assumptions and commitments set forth in all applicable safety basis documentation, when included as part of their contract.

5.2.8 Independent Safety Review Committee (ISRC)

- a. Provides independent technical reviews, in accordance with the appropriate FEMP procedure, of safety basis documents and associated safety documentation prior to approval by the FDF President and submittal to the DOE; reviews activities, facilities, programs, and documents as requested by the FDF President.
- b. Notifies the SA Team Coach when information or a situation has been identified that indicates a potential deficiency of previous DOE-approved safety documentation, or a possible reduction in the margin of safety as defined in any DOE-approved TSRs/OSRs.

5.2.9 Other FDF Management ensures all respective facilities, projects, and activities under their control receive the appropriate level of safety analysis, including, where appropriate, determination of USQs and review of safety basis documentation, as early in the life cycle as possible.

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5.2.10 Coach, Safety Analysis Team

- a. Assumes administrative and technical responsibility for the overall FEMP System Safety programs ensuring compliance with the requirements of the applicable Rules, DOE Orders and standards as described in applicable portions of the FEMP Management Plan and the Drivers of this manual.
- b. Conducts safety analyses in support of line organizations and provides written technical safety requirements to bound FEMP facilities, projects, and activities to ensure the health and safety of the public, workers, and protection of the environment.
- c. Provides support and technical expertise for the development and maintenance of safety basis documentation to line management and other organization leadership involved in the design of new facilities/activities, alterations of existing facilities/activities, and the decontamination and decommissioning of excess facilities.
- d. Ensures that implementing procedures are developed and implemented which provide detailed responsibilities and processes (steps) necessary for conducting system safety analyses, preparing technical safety requirements, the determination of unreviewed safety questions, the review of safety basis documentation, and the analysis, design, development, implementation and evaluation of training and qualification programs.
- e. Implements the Unreviewed Safety Question Determination and Safety Evaluation (USQD/SE) System designed to review procedures, including revisions of work plans, and modifications associated with all FEMP facilities, projects, or activities, which have DOE-approved safety basis documentation.
- f. Coordinates USQ determinations with affected line organizations and the Configuration Management Department.
- g. Prepares for submittal to DOE-FEMP, on a schedule corresponding to the periodic updates of the DOE-approved safety documentation, a report summarizing all situations for which a safety evaluation was required by DOE Order 5480.21, and indicating all "changes" considered in a safety evaluation and implemented six months or more before the submittal date of the report.

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- h. Ensures the development and maintenance of the USQ Determination and Safety Evaluation System and its implementing documents are in compliance with the requirements of DOE Order 5480.21.
- i. Ensures the development and maintenance of the Safety Basis Document Review (SBD R) process and its implementing documents are in accordance with the provisions of this manual and the implementing procedure.
- j. Reviews and approves all FEMP safety analysis documentation, including those documents prepared by other FEMP organizations, contractors, or subcontractors.
- k. Supports the conduct of integrated hazard analysis (Integrated Hazard Analysis) using a team approach, where applicable, and encourages the broad dissemination and use of results within the FEMP where hazard data and information are required or add value to risk-based, informed decision-making.
- l. Advises line management and other support organizations on the radiological and chemical hazards present at the FEMP site and the acceptable measures available for eliminating, controlling, or mitigating these hazards.
- m. Supports safety analysis activities related to the removal, remediation, and waste management projects and activities involving radioactive, chemical, hazardous materials, and other hazards greater than standard industrial hazards (SIHs) and standard construction activities.
- n. Supports line organizations in submitting and obtaining substantive, independent reviews of safety basis documents from the ISRC and DOE. Assists line management in resolving comments, correcting noted deficiencies, and preparing safety basis documents for approval.
- o. Performs, in conjunction with QA, reviews of facilities, projects, and activities subject to TSRs, SBRs, or administrative controls as documented in safety basis documents. Informs line management of technical problems or unsafe conditions and supports efforts to correct noted deficiencies.
- p. Controls and issues USQD/SE System Log numbers, and maintains the applicable tracking system(s) for these logs.
- q. Ensures, in accordance with the approved requirements and procedures, that all of the USQD/SE System documents, and their development files,

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are generated, administratively controlled and maintained in a readily auditable condition.

- r. Notifies the Nuclear and System Safety (NS) Functional Area Manager when information or a situation has been identified that indicates a potential deficiency of previous DOE-approved safety documentation, or a possible reduction in the margin of safety as defined in any DOE-approved TSRs/OSRs.
- s. Establishes the System Safety Programs, including the Safety Analyses Program and the USQD/SE System, training requirements for all FEMP personnel. Reviews and approves the content of system safety training.
- t. Ensures that an adequate number of SA Team personnel obtain the appropriate training and are Qualified Safety Evaluators (QSEs) and Technically Responsible (TR) individuals.
- u. Technically supports the development and conduct of TR and QSE training courses for the FEMP.
- v. Reviews and approves any request for USQD/SE Qualification Training for individuals NOT currently assigned to the Safety Analysis Team. Only the SA Team Coach may authorize persons not on the SA Team staff to take the QSE training and/or to perform QSE functions.
- w. Ensures that a copy of all revisions of safety analysis and approved safety evaluations which contain configuration changes are transmitted to the Configuration Management organization.
- x. Conducts annual self-assessment which includes the evaluation of the effectiveness, efficiency, and quality of the FEMP safety Analyses Programs.
- y. Provides liaison to DOE in all matters pertaining to FEMP safety basis policy, documents, audits, and other activities.

5.2.11 Safety Analysis Team Personnel

- a. Provide technical support to FEMP organizations or their subcontractors responsible for preparing, using, maintaining, and submitting safety basis documentation, including USQD/SEs, SBDRs, and HFEs.

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- b. **Ensure customer understanding of and agreement with the assumptions and parameters to be utilized in performing safety analyses and hazard categorizations, to the extent practical.**
- c. **Review and assist with comment resolution of safety basis documents, as appropriate.**
- d. **Assure criticality analyses are performed for appropriate facilities, projects, and activities by transmitting any such concerns to the NCS Lead.**
- e. **Maintain technical and administrative points of contact with FEMP line management organizations as assigned.**
- f. **Obtain, maintain and perform as a TR or QSE when assigned by SA Team Coach.**
- g. **Notify the SA Team Coach when information or a situation has been identified that indicates a potential deficiency of previous DOE-approved safety basis documentation, or a potential reduction in the margin of safety as defined in any DOE-approved TSRs/OSRs.**
- h. **Support the implementation of the FEMP Safety Basis Document Review (SBDR) process.**

ATTACHMENT A: DEFINITIONS

1. **Accident** - An unplanned sequence of events that results in undesirable consequences. (DOE-STD-3009-94)
2. **Accident Analyses** - For the purposes of properly implementing the USQ Order (5480.21), the term accident analysis refers to those bounding analyses selected for inclusion in the SAR. These analyses refer to design basis accidents only. (DOE Order 5480.21)
3. **Administrative Controls (ACs)** - Provisions relating to organization and management, procedures, recordkeeping, assessment, and reporting necessary to ensure safe operation of a facility. (DOE Order 5480.23) ACs are usually found in facility or project specific requirements documents.
4. **Annual** - When the term annual is used to describe the intervals between safety analysis reviews, revisions, and surveillances, it means a period of time not to exceed 15 months of the initial issuance date or the date of last review, etc., whichever applies.
5. **Auditable Safety Analysis (ASA)** - Similar to a SAR but with much reduced content and requirements, which provides systematic identification of hazards within a given DOE operation; and describes and analyzes the adequacy of measures taken to eliminate, control, or mitigate identified hazards. (DOE-EM-STD-5502-94) An ASR may be employed when a Safety Assessment concludes that further safety analysis is required.
6. **Auditable Safety Record (ASR)** - Documentation that contains the Auditable Safety Analysis (ASA) for radiological facilities and certain low hazard non-nuclear facilities at the FEMP to ensure that construction, operation, maintenance, shutdown, cleanup, and decommissioning activities can be safely performed in compliance with applicable laws, regulations, and requirements. An ASR may be employed when a Safety Assessment concludes that further safety analysis is required. This form of safety analysis may be either FDF or DOE-approved, depending on the facility, activity, or project described.
7. **Authorization Basis** - Those aspects of the facility design basis and operational requirements relied upon by the DOE to authorize operation. The FEMP authorization basis includes the following types of DOE-approved safety documents:
 - a. Safety Analysis Reports (SARs),
 - b. Basis for Interim Operations (BIOs),
 - c. Safety Evaluation Reports (SERs),

- d. Technical Safety Requirements (TSRs),
 - e. Operational Safety Requirements (OSRs), and
 - f. Other DOE-approved safety documentation, such as Auditable Safety Records (ASRs), Hazard Analysis Reports (HARs), or Safety Assessments. (DOE Order 5480.21)
8. Basis for Interim Operation (BIO) - BIO is a documented demonstration that nuclear facility operations can be conducted at an adequate level of safety until more detailed safety documentation, fully compliant with the requirements of DOE 5480.22 and DOE 5480.23, is developed and approved by DOE. For non-reactor nuclear facilities, a BIO is required for each Hazard Category 1, 2, and 3 facility whose safety documentation does not fully comply with DOE 5480.22 or DOE 5480.23. An approved BIO serves as the interim DOE safety basis until the upgraded safety documentation is developed and approved. (DOE-STD-3011-94)
9. Bounding Release Hazard - A radiological or chemical release hazard identified in an IHA which forms the basis of the radiological categorization and/or the non-nuclear chemical classification of a facility.
10. Cleanup Operation - An operation where hazardous substances are removed, contained, incinerated, neutralized, stabilized, cleaned up, or in any other manner processed or handled with the ultimate goal of making the site safer for people or the environment. [OSHA 29 CFR 1910.120 (3)]
11. Configuration - The functional and/or physical characteristics of hardware and/or software as set forth in technical documentation and achieved in a product.
12. Configuration Control - The systematic evaluation, coordination, and disposition of all proposed configuration changes and verification of approved change incorporation before or after the formal establishment of a baseline.
13. Configuration Management - The management process that assures consistency among the technical baseline, design requirements, physical configuration, and technical documentation, and the maintenance of this consistency through design, construction, operation, and decontamination and decommissioning. (CM-0001)
14. Decommissioning - The process of closing and securing a nuclear facility or nuclear materials storage facility to provide adequate protection from radiation exposure and to isolate radioactive contamination from the human environment. (DOE 5480.30)
15. Decontamination - The act of removing a chemical, biological, or radiological contaminant from, or neutralizing its potential effect on, a person, object or

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environment by washing, chemical action, mechanical cleaning, or other techniques. (DOE 5480.30)

16. **Delegation of Authority** - Written authorization, from the Assistant Secretary for Environmental Management, delegating review and approval authority for EM Field Activity Safety Documentation, that is specified into hazard categories through applicable DOE Orders as follows:
 - a. **Hazard Category 1 Nuclear Facilities and High Hazard Non-Nuclear Facilities**
There is no delegation for SARs, TSRs, OSRs, TSs, USQs, or SERs.
 - b. **Hazard Category 2 Nuclear Facilities and Moderate Hazard Non-Nuclear Facilities**
Approval authority for SARs, TSRs, OSRs, TSs, USQs, and SERs is delegated to the Operations/Field Office Manager and may be re-delegated within the Operations/Field Office.
 - c. **Hazard Category 3 Nuclear Facilities and Low Hazard Non-Nuclear Facilities**
Approval authority for SARs, TSRs, OSRs, TSs, USQs, and SERs is delegated to the Operations/Field Office Manager and may be re-delegated within the Operations/Field Office.
 - d. **Radiological/Other Industrial Facilities**
Contractor management is authorized to approve Auditable Safety Analyses (ASA) for radiological facilities as defined in DOE-EM-STD-5502-94.

(EM Memorandum dated August 08, 1994, DOE-EM Safety Authorization Delegation of Authority.)
17. **Design Basis** - The set of requirements that bound the design of systems, structures, and components (SSC) within the facility. These design requirements include consideration of safety, plant availability, efficiency, reliability, and maintainability. Some aspects of the design basis are important to safety, although others are not. (DOE Orders 5480.21 and 5480.23)
18. **Design Basis Accidents (DBAs)** - Accidents that are postulated for the purpose of establishing functional requirements for safety significant structures, systems, components, and equipment. (DOE Orders 5480.21 and 5480.23)
19. **Engineered Safety Features** - Systems, structures, and components (SSCs) that prevent and/or mitigate the consequences of all potential accidents including the bounding design basis accidents. (DOE Order 5480.23)

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20. **Equipment Important to Safety** - Equipment important to safety is intended to include any equipment whose function can impact safety either directly or indirectly. This includes safety-related equipment, equipment relied upon for safe shutdown, and in some instances, balance-of-plant equipment. (DOE Order 5480.21) At FEMP, equipment important to safety includes radiation detection alarms (RDAs) and fire protection/suppression sprinkler systems.
21. **Equivalent Component** - May be identical, meet all design, seismic specifications and quality class, or have been demonstrated and documented to be equivalent to another component.
22. **Evaluation Basis Accident (EBA)** - An accident postulated for evaluation of the performance of a facility for which documentable design basis accidents do not exist. The intent of an EBA is to derive from facility parameters an accident that can be used to determine the potential consequences of functional failures in mitigating or preventive systems. (DOE-DP-STD-3005-93)
23. **Facility** - Any equipment, structure, system, process, or activity that fulfills a specific purpose. In practical terms, this definition often reduces to the identification of buildings and other structures, their functional systems and equipment, and other fixed systems and equipment installed therein to delineate a facility. Operations and processes independent of buildings or other structures (e.g., waste retrieval and processing, waste burial, remediation, groundwater or soil decontamination, decommissioning, etc.) are encompassed by this definition. (DOE-DP-STD-3005-93) At the FEMP for safety analysis purposes, a facility is usually one or more geographically-related structures and/or spaces.
24. **Facility Owner** - The person designated as building custodian or the senior supervisor on shift in a plant.
25. **Fissile Material** see RM-0027.
26. **Graded Approach** - A process by which the level of analysis, documentation, and actions necessary to comply with DOE requirements are commensurate with the:
 - a. Relative importance to safety, safeguards, and security; and the magnitude of any hazards involved;
 - b. The complexity of the facility and/or systems being relied on to maintain an acceptable level or risk; and
 - c. Life cycle stage of the facility or activity. (DOE Order 5480.23)

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27. **Hazard** - A source of danger (i.e., material, energy source, or operation) with the potential to cause illness, injury, or death to personnel or damage to a facility or to the environment (without regard for the likelihood or credibility of accident scenarios or consequence mitigation). (DOE Order 5480.23)
28. **Hazard Analysis** - The process to determine that material, a system, a process, and plant characteristics can produce undesirable consequences, followed by the assessment of hazardous situations associated with a process or activity. Largely qualitative techniques are used to pinpoint weaknesses in design or operation of a facility that could lead to accidents that could expose members of the public, onsite workers, facility workers, and the environment to hazardous materials. (DOE-STD-3009-94)
29. **Hazard Analysis Report (HAR)** - A graded SAR for facilities at the FEMP. It is a controlled document, requiring DOE approval, which a Safety Assessment may recommend as additional safety basis documentation for a hazardous activity. A HAR focuses primarily on the facility/activity description to identify and evaluate the radiological and chemical hazards associated with a project, but it is often integrated to include OSHA-related safety concerns. As a graded SAR, a HAR incorporates programmatic controls by reference to programs discussed in existing safety basis documentation such as BIOs, Safety Documents and other safety analyses. It will establish the final categorization/classification of a facility and provide the basis for Safety Basis Requirements (SBRs) if any are identified during the hazard analysis process.
30. **Hazard Classes** - Primarily non-nuclear facilities will be categorized as high, moderate, or low hazards based on unmitigated releases of non-radiological hazardous material and the following:
 - a. **High** - hazards with a potential for onsite and offsite impacts to large numbers of people or for major impacts to the environment.
 - b. **Moderate** - hazards which present considerable potential onsite impacts to people or the environment, but at most only minor offsite impacts.
 - c. **Low** - hazards which present minor onsite and negligible offsite impacts to people and the environment.

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31. **Hazard Categories** - The consequences of unmitigated releases of radioactive and/or hazardous material are evaluated as required by DOE 5480.23 and classified by the following hazard categories:
 - a. **Category 1**
The hazard analysis shows the potential for significant offsite consequences.
 - b. **Category 2**
The hazard analysis shows the potential for significant onsite consequences.
 - c. **Category 3**
The hazard analysis shows the potential for only significant localized consequences. (DOE 5480.23)

(DOE-STD-1027-92 provides guidance and radiological threshold values for determining the hazard category of a nuclear facility.)
32. **Hazardous Materials** - Any solid, liquid, or gaseous material that is toxic, explosive, flammable, corrosive, or otherwise physically or biologically threatening to health. Oil is excluded from this definition. (DOE Order 5480.23)
33. **Human Factors (HF)** - The biomedical, psychosocial, work place environment, and engineering considerations that pertain to people in a human-machine system. Human factors safety, as used in DOE Order 5480.23, refers to the allocation of control functions to personnel versus automatic devices; staffing and qualification of operating crews; personnel training; the preparation, validation, and use of written procedures to guide operations, surveillance, and maintenance; and the design of the human-machine interface to build on strengths and protect against the susceptibility to human error in operating crews. [DOE Order 5480.23, Attachment 1, section 3.b.(1)(b)]
34. **Human Factors Evaluation (HFE)** - Both the process and the documented results of that process which includes an evaluation of a project design and anticipated operational activities sufficient to identify the appropriate form and kind of provisions which facilitate reliable performance in safety-related activities of operating crews. HFEs are performed, usually in conjunction with other safety basis documentation, on project designs, operations, activities, procedures, plans, training programs, and other applicable documents and activities using a graded approach, i.e., the greater degree of novelty or uniqueness, the greater depth/breadth of the evaluation.

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35. Inconsequential Change to a Procedure - A spelling or typographical correction, grammatical change, clarification, or additional note or reference. (DOE Order 5480.21) Such a change does not alter the meaning of the text in which the change occurs.
36. Independent Technical Review - A review conducted by an organization and/or individual who is knowledgeable in one or more pertinent areas of expertise and had no direct responsibility or input as an authorized contributor into the development of the technical content of an analysis, document, or activity being reviewed.
37. Integrated Hazard Analysis (IHA) - A qualitative analytical tool [formerly referred to as a preliminary hazard analysis (PHA)] usually performed early in the life of a project or activity to systematically identify, collect, and integrate information, in coordination with representatives of the project/activity and its support organizations as well as site organizations which have programmatic responsibilities for health and safety issues concerning:
 - a. Identification of hazards (materials in quantity, form, and location)
 - b. Energy sources, potential initiating events, causes of hazardous conditions
 - c. Consequences of hazardous events without preventative/mitigative measures
 - d. Preventive/mitigative measures
 - e. Frequency of occurrence of events (credibility of consequences)
 - f. Severity of consequences of events
 - g. Significance of hazards (risk, real and perceived).
38. Issue - A collective term which, in the FEMP USQD/SE System, refers to proposed changes/activities, condition, test, experiment, a discovered deficiency in a DOE-approved safety documentation, or a discovered unauthorized change which has already been made or implemented.
39. Limiting Condition for Operation (LCO) - The lowest functional capability or performance levels of safety-related structures, systems, components, and their support systems required for normal, safe operation of the facility. (DOE Order 5480.22, section 9.e.(3)(b))

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40. Limiting control Setting (LCS) - Setting on safety-related structures, systems, components that controls process variables to prevent exceeding safety limits. (DOE Order 5480.22 section 9.e.(3)(a)).
41. Line Organization (Management) - An unbroken chain of command which extends from the Secretary [of Energy] through the Under Secretary, to the [Program] Secretarial Officer (SO) who sets program policy and plans and develops assigned programs, to the field organization managers responsible to the SO for execution of these programs, to contractors [FDF] who conduct the programs. Accordingly, line management responsibility for safety (safety analyses) flows from the Secretary through the Under Secretary, to EM-1, to the Manager DOE-FEMP, to the President of FDF, to the managers and supervisors responsible for the cleanup, remediation, decontamination, and waste management activities at the FEMP.
42. Margin of Safety - The margin built into the safety analyses of the facility as set forth in the authorization basis acceptable limits. (DOE Order 5480.21)
43. Material-at-Risk (MAR) - The material-at-risk is the amount of radionuclides (in grams or curies of activity for each radionuclide) available to be acted on by a given physical stress. For facilities, processes, and activities, the MAR is a value representing some maximum quantity of radionuclide present or reasonably anticipated for the process or structure being analyzed. Different MARs may be assigned for different accidents as it is only necessary to define the material in those discrete physical locations that are exposed to a given stress. For example, a spill may involve only the contents of a tank in one glovebox. Conversely, a seismic event may involve all of the material in a building. [DOE-HDBK-3010-94]
44. Mitigative Feature - Any structure, system, or component that serves to mitigate the consequences of a release of hazardous materials in an accident scenario. (DOE-STD-1027-92). That which reduces the consequences after an accident has occurred.
45. Modification - Any change or alteration to a facility/system which affects the form, fit, or function of equipment, systems, processes, or facilities, and which does not involve direct same-for-same replacement of components (or like-for-like, if substitutes were previously analyzed and approved) or routine maintenance utilizing approved procedures.

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46. **Non-reactor Nuclear Facility** - Those activities or operations that involve radioactive and/or fissionable materials in such a form and quantity that a nuclear hazard potentially exists to the employees, general public, or environment. Included are activities or operations that:
- a. Produce, process, or store radioactive liquid or solid waste, fissionable materials, or tritium;
 - b. Conduct separation operations;
 - c. Conduct irradiated material inspection, fuel fabrication, decontamination, or recovery operations;
 - d. Conduct fuel enrichment operations;
 - e. Perform environmental remediation or waste management activities involving radioactive materials; or
 - f. Design, manufacture, or assemble items for use with radioactive materials and/or fissionable materials in such a form or quantity that a nuclear hazard potentially exists. (DOE Order 5480.23)
47. **Non-Standard Hazards** - Hazards that are not routinely encountered or accepted by a vast majority of the general public in the course of everyday living. Non-standard hazards are used to categorize DOE facilities as High, Moderate, or Low Hazard facilities via the hazard classification process.
48. **Nuclear Experience** - When used in regard to the FEMP USQD/SE System, is experience acquired at any facility in which radioactive materials are routinely handled, stored, processed, or utilized. To obtain credit for this experience, the candidate TR/QSE must be able to demonstrate by training, dosimetry and/or work records that the job/tasks performed by the candidate were directly related to or involved with the handling, storage, processing, or utilization of radioactive materials for a minimum of one year prior to the registration for USQD/SE System Training. In addition, the QSE shall demonstrate via written documentation of at least one year of experience in the area of nuclear safety evaluations, such as active participation/assignment in a plant/process safety, process engineering, nuclear/radiological safety, or nuclear process operational/technical support organization at a nuclear facility in which radioactive materials are routinely handled, stored, processed, or utilized.
49. **Nuclear Materials** - All materials so designated by the Secretary [of the Department of Energy]. Presently, these materials are: depleted uranium, enriched uranium, americium-241, americium-243, curium, berkelium, californium,

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plutonium 238-242, lithium-6, uranium-233, normal uranium, neptunium-237, deuterium, tritium, thorium. (DOE Order 5633.3B)

50. Onsite/Site - The facility/site area over which the Lead Federal Agency (at the FEMP this is the DOE) has access control authority. The onsite area includes any area that has been established as a National Defense Area or National Security Area. (DOE Order 5500.1B) [For the purposes of this site requirement document and resulting site procedures addressing safety analysis, FEMP facilities, projects, and activities that are physically beyond the boundaries of the FEMP Site will be assessed for consideration as an "onsite" area based on the DOE's access control authority. Such determinations will be incorporated into the appropriate safety analyses and related calculations.]
51. Operable Unit (OU) - Term for each of a number of separate activities undertaken as part of a Superfund site cleanup. The FEMP consists of five operable units. Portions of OU5 physically extend beyond the FEMP Site property boundaries.
52. Operational Safety Requirement (OSR) - Applicable to non-nuclear, radiological, and other industrial facilities/activities, when safety analysis determines that TSRs are not required/applicable, but one or more limits have been established to ensure the safety operation of the facility/activity in question. (Also, see definition of TSR.)
53. Preventive Feature - Any structure, system, or component that serves to prevent the release of hazardous material in an accident scenario. (DOE-STD-1027-92) In risk assessments, also called a "control" and "preventive measure."
54. Process Requirement (PR) - A requirement that ensures a facility, operation, or activity remains safe in accordance with good management practices, routine conditions, and anticipated operating modes. PRs may also be developed and implemented to help ensure that SBRs are not exceeded or otherwise violated. PRs are approved by FDF.
55. Process Safety Management (PSM) - A process or activity involving the application of management principles as defined in 29 CFR 1910.119, "Process Safety Management of Highly Hazardous Chemicals." (DOE-STD-3009-94)
56. Programmatic - Reference to facility specific programs or site-wide programs necessary to ensure the safe operation of a facility. Radiation protection, hazardous material protection, quality assurance, training, document control, and emergency preparedness are examples of programs that provide programmatic controls to ensure safe operation. (DOE-STD-3009-94)
57. Project - See ED-12-1003

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- 58. Project Engineer - See ED-12-1003.
- 59. Project Manager - See ED-12-1003.
- 60. Project-Specific Plans - Scoping documents required for any program or project. Project-specific plans may include, but are not limited to, work plans, field sampling plans, health and safety plans, and standard operating procedures.
- 61. Public - All individuals outside the DOE site boundary.
- 62. Qualified - Satisfactory completion of a training program based on knowledge, skills, and abilities that are necessary for the performance of assigned responsibilities.
- 63. Qualified Safety Evaluator (QSE) - An individual who is qualified to prepare and/or review a USQ Screen and prepare USQD-SE by having met, at least, the minimum selection criteria and successfully completed the USQD System Safety Evaluator Training and Qualification Course. Once the training is successfully completed, the individual will be referred to as a Qualified Safety Evaluator (QSE).
- 64. Quality - The condition achieved when an item, service, or process meets or exceeds the user's requirements and expectations. (RM-0012)
- 65. Quality Assurance (QA) - All those actions that provide confidence that quality is achieved. (RM-0012)
- 66. Quality Control (QC) - The overall system of technical activities that measures and controls the quality of a process, item, or service so that it meets the stated needs of the user. (RM-0012)
- 67. Radiological Facilities - A facility that does not meet or exceed the hazard category 3 threshold values published in Table A.1 of DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*, but contains some quantity of radioactive material (above those discussed in Appendix B to 40 CFR 302). (DOE-EM-STD 5502-94 and DOE-STD-1027)
- 68. Record - A completed document or other media that provides objective evidence of an item, service, or process. (RM-0012)
- 69. Requirement Manual (RM) - A site document defining and establishing federal and state regulations/laws or management practices that are applicable to the FEMP. All organizations are responsible for implementing requirements, as applicable,

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through a site level or department procedure. (A requirement manual is not an instructional document and is not to be used when performing work.)

70. **Risk** - A quantitative or qualitative expression of possible loss which considers both the probability that a hazard will cause harm and the consequences of that event. (DOE Order 5480.23)
71. **Routine or Planned Maintenance Activity** - Activity that does not change the normal, functional condition of the facility. Such routine or planned maintenance activities include the refilling of the nitrogen gas bottles on the RDA system; the performance of routine PMs on equipment; the replacement of limited life-time items (filters, light fixtures, fuses, valve handles, hoses, etc.) with equivalent components; calibration; refurbishment; and housekeeping. (DOE Order 5480.21)
72. **Safety Analysis** - A documented process that provides systematic identification of hazards within a given DOE operation; describes and analyzes the adequacy of measures taken to eliminate, control, or mitigate identified hazards; and analyzes and evaluates potential accidents and their associated risks. (DOE Order 5480.23)
73. **Safety Analysis Documentation** - At FEMP, records containing the elements of analysis upon which operational, procedural, and administrative decisions are based that ensure the health and safety of the public, the work force, and the environment. FEMP safety analysis documents include, but are not limited to, Safety Assessment, Auditable Safety Record (ASR), Basis for Interim Operation (BIO), Preliminary Safety Analysis Report (PSAR), Final Safety Analysis Report (FSAR), Safety Analysis Report (SAR), Hazard Analysis Report (HAR), Technical Safety Requirement (TSR), Operational Safety Requirement (OSR), Process Requirements (PRs), Safety Analysis Report for Packaging (SARP), and Unreviewed Safety Question Determination and Safety Evaluation (USQD/SE).
74. **Safety Analysis Program** - A program required for all Department of Energy (DOE) contract operators on non-reactor nuclear facilities, as established in DOE Order 5480.23, Nuclear Safety Analysis Reports. This program provides for the analysis and review of all operations at facilities with the end goal of reducing the risks associated with operation of these facilities after accounting for all measures which have been taken to eliminate, mitigate, or control hazards identified during the course of the analysis process. Hazards of a standard industrial nature, i.e., those which are routinely encountered in industry and accepted by the public, are not governed by this system. Safety analysis documentation is generated to assist in fulfilling the requirements of this system.
75. **Safety Analysis Report (SAR)** - A report that documents the adequacy of safety analysis for a nuclear facility to ensure that the facility can be constructed,

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operated, maintained, shut down, and decommissioned safely and in compliance with applicable laws and regulations. (DOE Order 5480.23)

- a. Preliminary SAR (PSAR) - A safety analysis document produced early in the engineering phase of a project which systematically identifies safety design criteria; analyzes potential hazards, and proposes measures to eliminate, control, or mitigate these hazards; and evaluates the potential risks. (Line management is required to obtain EM-1 or designee approval of PSARs prior to undertaking procurement of materials and components, construction, and pre-operational testing of DOE nuclear facilities, unless authorized by DOE in writing.)
 - b. Final SAR (FSAR) - A safety analysis document produced after the construction of but before the operation of a facility or activity which systematically identifies hazards; describes and analyzes the adequacy of measures taken to eliminate, control, or mitigate these hazards; and analyzes and evaluates the potential accidents and associated risks. (Line management is required to obtain EM-1 or designee approval of FSARs prior to operating a DOE nuclear facility.)
 - c. PSAR and FSAR documents may be merged into a single FSAR or may be submitted to DOE in stages with written approval of EM-1.
76. Safety Analysis Report for Packaging (SARP) - A safety analysis document that provides a comprehensive technical evaluation and review of the design, testing, operational procedures, maintenance procedures, and quality assurance program for packaging. It demonstrates compliance with the Nuclear Regulatory Commission (NRC) and Department of Transportation (DOT) regulatory safety standards or equivalent standards established by the Department of Energy (DOE) for approving packaging and issuing Certificates of Compliance. (RM-0027)
77. Safety Assessment - FEMP Form FS-F-2706, Request for Safety Analysis Support. A brief, factual, and objective document used for new facilities, projects and activities to:
- a. Screen the activity, project, or facility to determine if non-standard industrial hazards exist;
 - b. If non-standard industrial hazards exist, provides for the performance of an integrated hazard analysis;
 - c. Provides for the documentation of nuclear hazard categorization, radiological hazard categorization, and chemical hazard classification;

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- d. Document the need for additional safety analyses, e.g., ASR, SAR, HAR.
 - e. Document a request for Human Factors Evaluation (HFE)
 - f. Document a request for other Safety Analysis Team support.
78. **Safety Basis** - A combination of information relating to the control of hazards at a facility (including design, engineering analyses, and administrative controls) upon which the DOE depends for its conclusion that activities at the facility can be conducted safely. (DOE Order 5480.23) Or in the case of FDF-approved safety basis documents, ...upon which FDF depended for its conclusion that the addressed activity, project, or facility can be performed, conducted, or operated safely.
79. **Safety Basis Document (SBD)** - any FDF or DOE approved document which documents the safety basis for an activity, project and/or facility, e.g., safety assessment, ASR, BIO, HAR, SAR, TSR, NSOA, CSA.
80. **Safety Basis Document Review (SBDR)** - Both the process and the documented results of that process whereby proposed changes to FDF-approved safety basis documentation are reviewed to retain and maintain the established safety basis.
81. **Safety Basis Requirement (SBR)** - Are intended to keep a facility or activity within its established safety envelop. An SBR is a limitation for a facility, operation, or activity which is directly associated with its analyzed safety envelope and current hazard categorization or classification. Some examples of SBRs include:
- a. In nuclear facilities with a Safety Analysis Report (SAR) or Hazard Analysis Report (HAR), the SBRs are called Technical Safety Requirements (TSRs) and are subject to DOE Order 5480.22 and 5480.23.
 - b. Inventory threshold limits and/or dose limits established in a safety basis document. Each nuclear facility BIO states threshold limits.
 - c. Limitations on material types, characteristics, and unique properties, such as, pyrophoricity, corrosiveness, toxicity, reactivity, flammability, etc., as specified in the analysis.
 - d. Nuclear criticality safety requirements related to the direct prevention of a criticality, i.e., maintaining compliance with the double contingency principle is an SBR.
82. **Safety-class Structures, Systems, and Components (Safety-class SSCs)** - Systems, structures, or components including primary environmental monitors and

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portions of process systems, whose failure could adversely affect the environment, or safety and health of the public as identified by safety analyses. (DOE-STD-3009-94)

83. Safety Evaluation - A record required to document the review of a "change". This document records the scope of the evaluation and the logic for determining whether or not an Unreviewed Safety Question exists. (DOE Order 5480.21)
84. Safety Limits - Limits on process variables associated with those physical barriers, generally passive, that are necessary for the intended facility functions and which are found to be required to guard against the uncontrolled release of radioactivity and other hazardous materials (this includes releases into the complex and/or the community). [DOE Order 5480.22, section 9.e.(2)]
85. Safety-significant Structures, Systems, and Components (safety-significant SSCs) - Structures, systems, and components not designed as safety-class SSCs but whose preventive or mitigative function is a major contributor to defense in depth (i.e., prevention of uncontrolled material releases) and/or worker safety as determined from hazard analysis. This designation should not be confused with the generic modifier "safety significant" used in DOE Order such as DOE Order 5480.23. (DOE-STD-3009-94)
86. Safety Structures, Systems, and Components (Safety SSCs) - The set of safety-class structures, systems, and components, and safety-significant structures, systems, and components for a given facility. (DOE-STD-3009-94)
87. Shall, Should, and May - Shall is used to denote a requirement; should is used to denote a recommendation; and may is used to denote permission, neither a requirement nor a recommendation. (DOE Order 5480.20A)
88. Site Boundary - A well-marked boundary of the property over which the owner and operator can exercise strict control without the aid of outside authorities. (DOE-STD-3009-94)
89. Standard - A specific set of rules or conditions concerned with the classification of components; delineation of procedures; definitions of terms; specification of materials, performance, design, or operations; or measurements of quality in describing materials, products, systems, services or practices. Standards may be specified by DOE as mandatory (i.e., required) or recommended.
90. Standard Construction Activity - Any construction, alteration, demolition, repair, maintenance, or renovation of structures, substrates, or portions thereof, that do not possess the potential for releasing significant quantities of radiological and/or hazardous materials; i.e., do not meet or exceed 40 CFR 302 quantities.

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91. Standard Hazards - Hazards that are routinely encountered or accepted by a vast majority of the general public in the course of everyday living.
92. Standard Industrial Hazard (SIH) - Hazards that are routinely encountered in general industry and construction, and for which national consensus codes and/or standards (e.g., OSHA, transportation safety) exist to guide safe design and operation without the need for special analysis to define safe design and/or operational parameters. (DOE-STD-3009-94)
93. Subcontractor - All non-FDF employees requiring access to the FEMP for the purpose of providing supplies, services, or construction activity in performance of a contractual obligation. Onsite employees of other DOE prime contractors will be considered subcontractors.
94. Technical Safety Requirements (TSRs) - Those requirements (previously designated as OSRs) that define the conditions, safe boundaries, and the management or administrative controls necessary to ensure the safe operation of a nuclear facility and to reduce the potential risk to the public and facility workers from uncontrolled releases of radioactive materials or from radiation exposure due to inadvertent criticality. A TSR consists of operating limits, surveillance requirements, administrative controls, use and application instructions, and the basis thereof. TSRs are to eventually replace OSRs. (DOE Order 5480.22)
95. Technically Responsible Individual (TRI) - An individual who is technically responsible for the issue and performs the USQ Screen. The TRI is trained to prepare these screens by having successfully completed the USQ-TRI Training course. The TRI can be any individual who has successfully completed the USQ-TRI training course within an organization that can make changes to a nuclear facility or activity at the FEMP.
96. Undue Risk - A level of identifiable risk that is unacceptable to the DOE.
97. Unreviewed Safety Question (USQ) Determination - A determination made by examining the following circumstances:
 - a. temporary or permanent changes in the facility as described in existing safety analyses;
 - b. temporary or permanent changes in the procedures as derived from existing safety analyses; and
 - c. tests or experiments not described in existing safety analyses.

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On identification of any of the above circumstances, an Unreviewed Safety Question [USQ] exists if one or more of the following conditions result:

- a. the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety as previously evaluated in the facility safety analyses could be increased;
- b. the possibility for an accident or malfunction of a different type than any evaluated previously in the facility safety analyses could be created; and
- c. any margin of safety as defined in the bases of the Technical Safety Requirements could be reduced.

(DOE Order 5480.22)

ATTACHMENT B: ABBREVIATIONS and ACRONYMS

ASR	Auditable Safety Record
BIO	Basis for Interim Operation
CSA	Criticality Safety Approval
DBA	Design Basis Accident
DOE	Department of Energy
DOT	Department of Transportation
EBA	Evaluation Basis Accident
EPA	Environmental Protection Agency
FA	Functional Area
FAM	Functional Area Manager
FDF	Fluor Daniel Fernald
FEMP	Fernald Environmental Management Project
FSAR	Final Safety Analysis Report
HAR	Hazard Analysis Report
HASP	Health and Safety Plan
H&S	Health and Safety
IHA	Integrated Hazard Analysis
ISRC	Independent Safety Review Committee
NS	Nuclear and System Safety
ORR	Operational Readiness Review
OSR	Operational Safety Requirement
OU	Operable Unit
PR	Process Requirement
PSAR	Preliminary SAR
PSM	Process Safety Management
PSS	Potentially Safety Significant
QA	Quality Assurance
RM	Requirement Manual
SA	Safety Analysis
SAR	Safety Analysis Report
SARP	Safety Analysis Report for Packaging
SER	Safety Evaluation Report
S&H	Safety and Health
SIH	Standard Industrial Hazard
S/RID	Standards/Requirements Identification Document
SSC	Systems, Structures, and Components

ATTACHMENT B: ABBREVIATIONS and ACRONYMS

TSR	Technical Safety Requirement
USQ	Unreviewed Safety Question
USQD	Unreviewed Safety Question Determination
USQD/SE	Unreviewed Safety Question Determination and Safety Evaluation

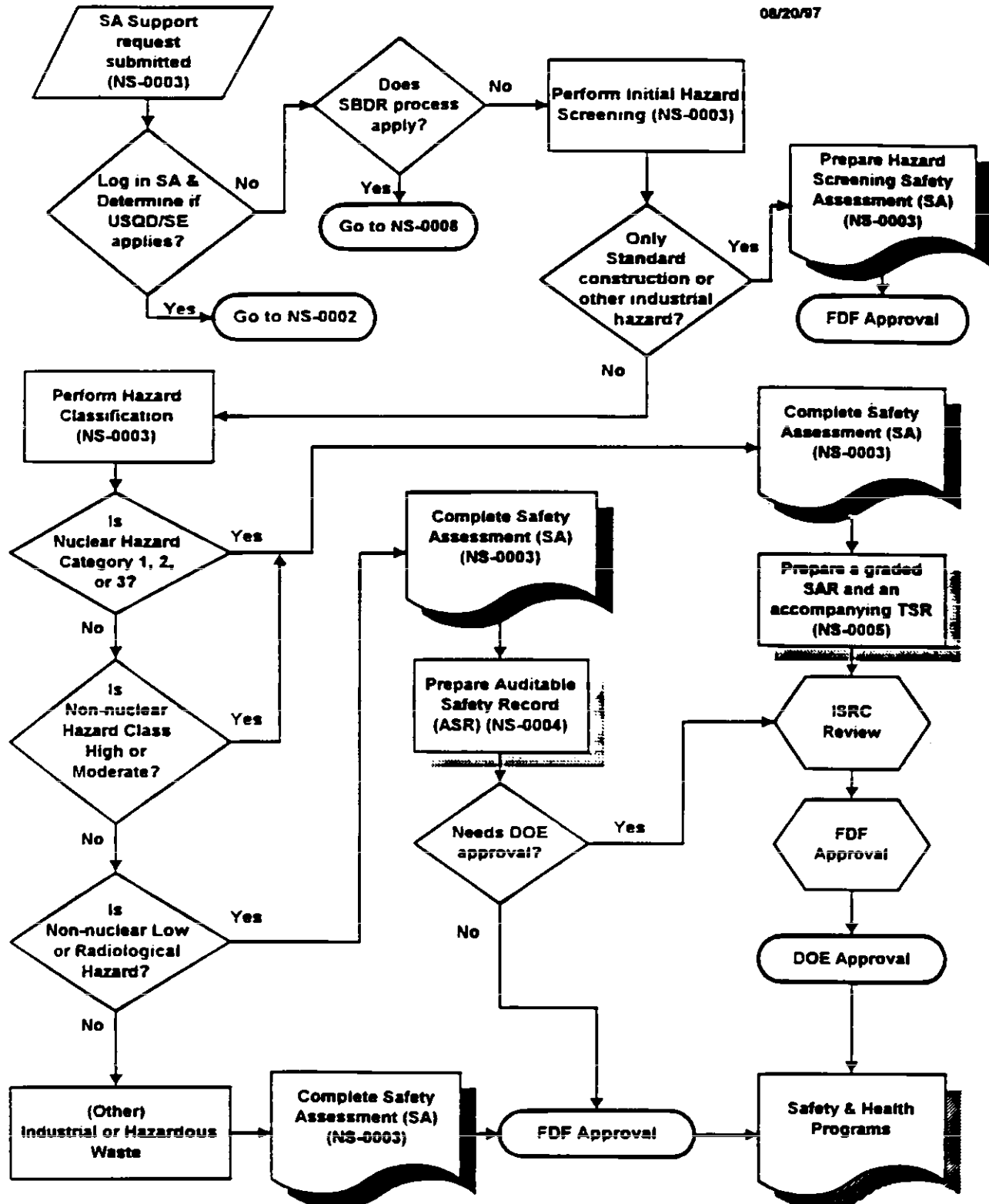
ATTACHMENT C: SYSTEM SAFETY PROCESS FLOW DIAGRAMS

The following diagrams are included in this section:

- Safety Analyses Programs Processes
- FEMP USQ Process for Proposed Changes
- USQD/SE process for Discovered Inadequacies and Unauthorized Changes

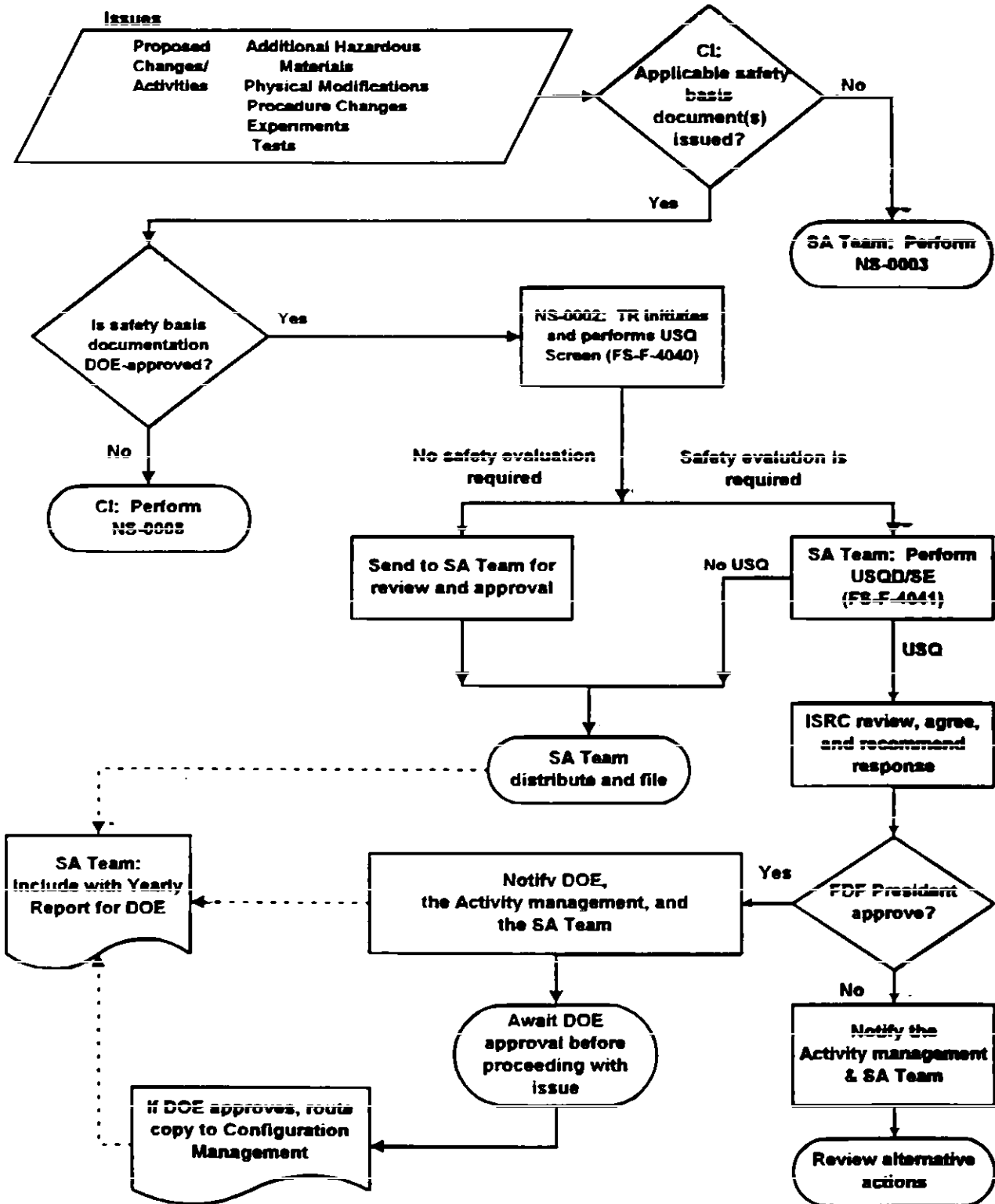
SAFETY ANALYSES PROGRAMS PROCESSES

08/20/97



FEMP USQ PROCESS FOR PROPOSED CHANGES

08/20/97

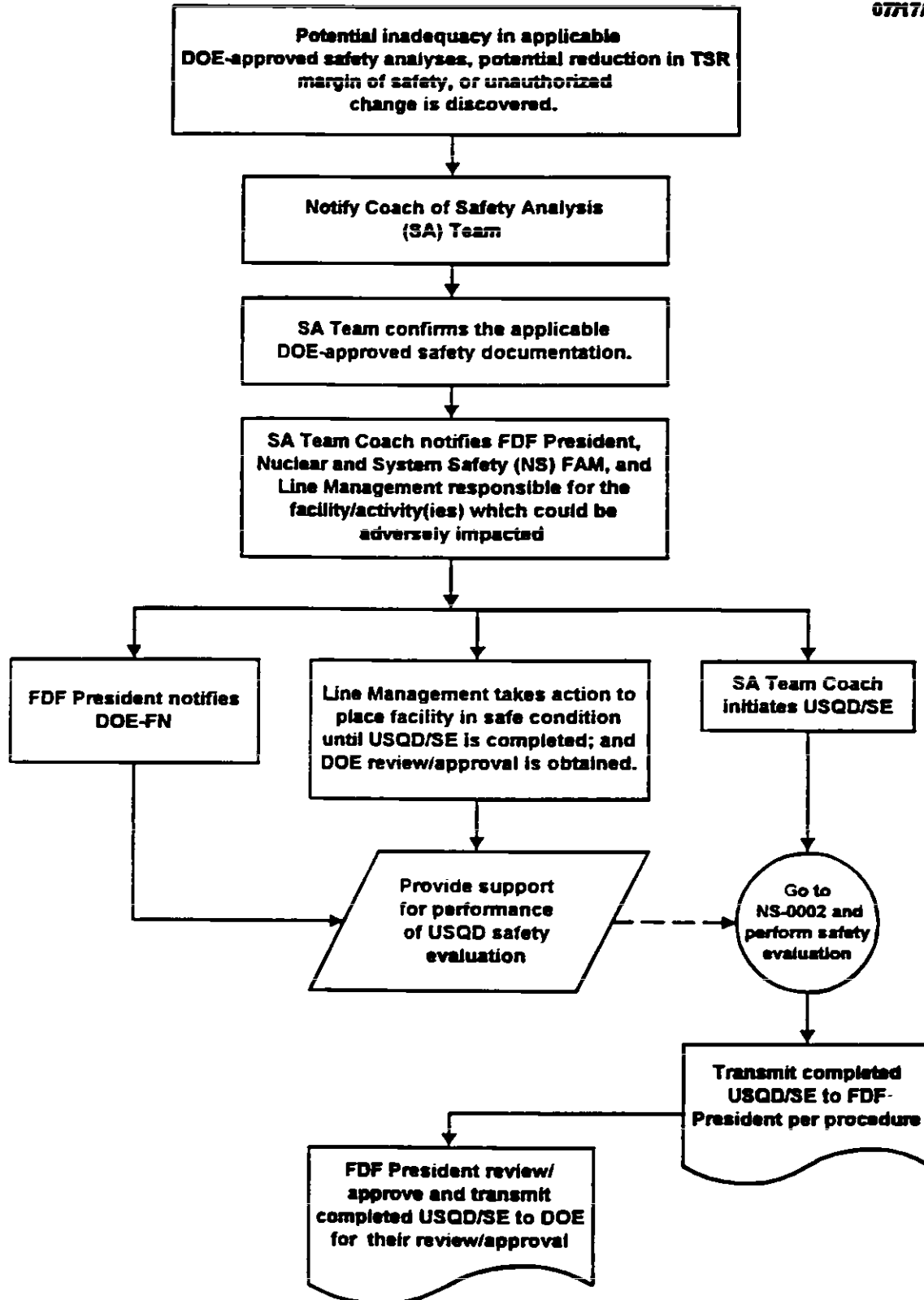


CI = Change Initiator

TR = Technically Responsible Individual

USQD/SE Process for Discovered Inadequacies and Unauthorized Changes

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**ATTACHMENT D: SYSTEM SAFETY
DOCUMENT HIERARCHY**

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